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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
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OFFICE NOTE 233

NMC MODEL RUN HISTORY TAPES

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NMC MODEL RUN HISTORY
Staff of Automation Division

INTRODUCTION

     This office note describes the run history tapes generated
during the operational running of the major numerical prediction
models in use at the National Meteorological Center and is an
update to Office Note 108, NMC Archives, dated April 1975.

     The run history tapes are designed and generated for inter-
nal use within NMC for both operational and developmental pur-
poses.   For every run of each of the basic models, a tape is
written containing the observational data, analyses, forecasts,
and other information relevant to that operational run.   These
tapes serve to diagnose problems with a run, to carry out expe-
riments with data and to serve as backup to our operations.

METHOD

     Run history tapes are generated for the regional (RGN),
large scale (GBL) and data assimilation (FNL) analysis and fore-
casting models.   A set of 62 tapes is maintained for each of
these models, one tape per model for each cycle in a month.
These tapes are overwritten each month; the information for a
particular day and cycle of a month replaces the data from the
same day and cycle of the previous month.

     Each input data set is written to a history tape as a logi-
cal file preceded by a 176 byte special record identifying the
data, its physical characteristics, and the amount of space
needed to recreate this data on disk.   The first 44 bytes of
this record define the logical file number, the file name, and
in the case of Fortxdam generated files, the maximum number of
data entries.   The remaining 132 bytes contain information from
the Job File Control Block (JFCB) for each data set as described
in the IBM manual on system control blocks[1].

     Directories for each run history tape are written as the
first logical file on the tape. This file is named 'RUNHST' and
consists of one 6400 byte record.   When printed 80 bytes at a
time in "A" format, it supplies the user with the name and date

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[1] IBM SYSTEMS LIBRARY (GC28-6628-8) SYSTEM CONTROL BLOCKS

of the tape and provides a list of the files expected thereon. The user should be aware that this record is written first and thus does not indicate that this tape is complete or that the individual files contain legitimate or up to date data, but rather it is intended as a directory of the files we intend to copy to each run history and gives the order of their appearance on that volume. Since there is no checking of input data the user should validate any files used from these history tapes.

The file containing the TIROS satellite reports is written on the final (FNL) run history tape as a separate physical file. The satellite report directory (TSDCTY) and the satellite flag (TSFLAG) files are written to the appropriate run history and are indicated in the RUNHST directory for those tapes. The user should refer to the appendices for data set names and retrieval method.

USAGE

To properly use the information retrieved from the history tapes the user should be familiar with the access method and format of the different data files. There are specific library routines[1] for reading grid point data generated by the various NMC models and a number of formal papers[2] which explicitly describe the formats used in most of the NMC data files. A system procedure has been designed to help the user recover data from the run history tapes or to get an inventory of the files on any particular tape (see appendix A).

The user is encouraged to use the proc NWSRHIST to retrieve data from the history tapes, but if necessary these tapes may be accessed directly by using one of the following cataloged data set names:

```
        RGN  -   NWS.NMC.HISTORY.RGNddcc
        GBL  -   NWS.NMC.HISTORY.GBLddcc
        FNL  -   NWS.NMC.HISTORY.FNLddcc
```

Where:
```
        dd = day of the month (01-31)
        cc = cycle of the run (00 or 12)
```

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[1] See documentation on Automation Division "W3LIB" Routines: W3FK00, W3FK01, W3FK03, W3FT18, W3FT19, and W3FT20.
[2] NMC Office Note 29 NMC FORMAT FOR OBSERVATIONAL DATA.
   NMC Office Note 84 NMC 360/195 PACKED DATA FIELDS.
   NMC Office Note 85 NMC 360/195 DATA SETS.
   NMC Office Note 124 NMC FORMAT FOR SURFACE REPORTS.
   NMC/EDS MEMO BY L. E. HYATT (5/10/78)
   FINALIZATION OF NMC/EDS FILE FORMATS FOR TOVS DATA.

Anyone using a run history directly is strongly advised to use "DISP=(OLD,PASS)" or "DISP=(OLD,KEEP)" in assigning the disposition of that tape. This will cause the requested volume to be mounted in a file protect state, thus keeping it from inadvertently being overwritten.

APPENDIX A

RUN HISTORY RETRIEVAL

DATA RETRIEVAL

A cataloged procedure NWSRHIST is available to assist in retrieving files from the run history tapes. It uses a series of input parameters and cards to identify the date and type of data desired. The format is as follows:

```
//step    EXEC    NWSRHIST,DATE=dd,CYCLE=cc,RUN=rrr
//SYSIN   DD *
request cards
/*
```

where:
          dd = day of the month (01-31)
          cc = cycle of run (00 or 12)
         rrr = one of the operational names
               (currently RGN, GBL, and FNL)

Each file should be requested using the naming conventions found in appendix B. This procedure will create a temporary data set for each of the logical files requested. Normally such data sets assume the name of the file as given in appendix B.

The user, however, has the option of assigning another name to any of these files by indicating this name on a request card. The single exception is the special TIROS file, which must always have the name TIROSDTA both as a request field and as the name of the generated data set.

The request cards contain the names of the data files to be retrieved and, if desired, new names for any of the output data sets. Each request should have the form:

    NAME(NEWNAME)

Where:

    NAME = A required parameter supplying the name of data
           file and its cycle (refer to appendix B).

 NEWNAME = An optional parameter giving the user the
           capacity to supply another name of up to eight
           characters for this file.

There are no restrictions on either the order that the data is requested or the number of items per input card as long as

the first request begins before column 72, subsequent request are separated by commas, and the last request is complete and does not extend beyond column 72. Blanks are not permitted between or within fields.

The user may access the temporary data sets created by this procedure either by using the default name, in which case the following JCL is appropriate:

```
//ddname DD  DSN=&&NAME,VOL=REF=*.step.RUN.HISTORY,
//          DISP=(OLD,DELETE)
```

or the rename feature may be used, in which case the JCL would be:

```
//ddname DD  DSN=&&NEWNAME,VOL=REF=*.step.RUN.HISTORY,
//          DISP=(OLD,DELETE)
```

In the user step the "VOL" parameter is necessary to adequately define the volume on which these data sets reside and should always be included. Since the user controls the first qualifier, the reference to "STEP" would vary depending on the name supplied for that step, while the last two qualifiers would remain constant. For a more detailed explanation, refer to the chapter on "VOLUME PARAMETER" in the IBM JCL MANUAL<1>.

It is strongly recommended that these temporary data sets be specifically deleted before the user job terminates so as not to fill up the system utility disk packs. Normally the operating system would carry out this function; but due to the manner in which they are created, we are forced to depend on the users to delete these files.

RESTRICTIONS

The procedure NWSRHIST is appropriate only for those tapes generated by the new run history program implemented June 1, 1983. Users wishing to extract data from history tapes predating this new system should use the catalogued procedures designed for those tapes<2>. Using an incorrect tape with this new PROC will result in an abnormal termination of the jobstep with a condition code 11.

<1> IBM SYSTEMS LIBRARY (GC28-6704-3) JOB CONTROL LANGUAGE REFERENCE
<2> NWSLDLFM- retrieves LFM data.
    NWSLDOPL- retrieves operational data (7LPE or SPECTRAL).
    NWSLDFNL- retrieves final data.

FUNCTIONAL CHARACTERISTICS

     The NWSRHIST procedure requires a region size of 230K, a few
seconds of CPU time and a few minutes clock time depending on
the amount of data requested. Retrieving the TIROS data from
the second file of the FNL run history tape adds about 4 minutes
clock time to this jobstep.

EXAMPLES

     1.   The user is requesting four items from the 00Z GBL run
history tape for the first day of the month.   Two of the items
are given new names while the other two use default names.

```
//LOAD   EXEC NWSRHIST,DATE=01,CYCLE=00,RUN=GBL
//SYSIN  DD    *
  SFCBOG00,ADPUPA00,F1200(FCST),
  ADPSFC00(SURFACE)
/*
//USERSTEP EXEC PGM=USERPGM
//FT01F001 DD DSN=&&SFCBOG00,VOL=REF=*.LOAD.RUN.HIST,
//            DISP=(OLD,DELETE)
//FT02F001 DD DSN=&&ADPUPA00,VOL=REF=*.LOAD.RUN.HIST,
//            DISP=(OLD,DELETE)
//FT03F001 DD DSN=&&SURFACE,VOL=REF=*.LOAD.RUN.HIST,
//            DISP=(OLD,DELETE)
//F12      DD DSN=&&FCST,VOL=REF=*.LOAD.RUN.HIST,
//            DISP=(OLD,DELETE)
```


     2.   The user is requesting the TIROS and TIROS directory data
from the 12Z FNL run history tape for the 31st of the month.

```
//LOAD    EXEC NWSRHIST,DATE=31,CYCLE=12,RUN=FNL
//SYSIN  DD    *
  TIROSDTA,TSDCTY12
/*
//USERSTEP EXEC PGM=USERPGM
//FT01F001 DD DSN=&&TIROSDTA,VOL=REF=*.LOAD.RUN.HIST,
//            DISP=(OLD,DELETE)
//FT02F001 DD DSN=&&TSDCTY12,VOL=REF=*.LOAD.RUN.HIST,
//            DISP=(OLD,DELETE)
```


     3.   The user is using this PROC to obtain a listing
of the RUNHST file from the 00Z RGN tape.

```
//LOAD EXEC NWSRHIST,DATE=01,CYCLE=00,RUN=RGN
//SYSIN  DD *
RUNHST
/*
```

APPENDIX B

RUN HISTORY DIRECTORY

This appendix gives an itemized list of each of the six run
history tapes currently in use as of June 1983.

RGN RUN HISTORY TAPE FOR THE 00Z CYCLE.

LOGICAL FILE	FILE NAME	DATA TYPE	LOGICAL FILE	FILE NAME	DATA TYPE
01	RUNHST	C2	14	SMFERR00	B2
02	ADPSFC00	C2	15	FMTENC00	B2
03	SFCSHP00	C2	16	GES00	B1
04	SFCBOG00	C2	17	FMANL00	B1
05	ADPUPA00	C2	18	ANL100	B1
06	AIRCFT00	C2	19	FM0000	B1
07	UPABOG00	C2	20	FM1200	B1
08	SATWND00	C2	21	FM2400	B1
09	AIRCAR00	C2	22	FM3600	B1
10	LFMBND00	B2	23	FM4800	B1
11	FMSIGM00	B2	24	SGANL00	B1
12	ERRANL00	B2	25	RADAR00	B1
13	SIGANL00	B2	26	DATE00	C2

RGN RUN HISTORY TAPE FOR THE 12Z CYCLE.

LOGICAL FILE	FILE NAME	DATA TYPE	LOGICAL FILE	FILE NAME	DATA TYPE
01	RUNHST	C2	14	SMFERR12	B2
02	ADPSFC12	C2	15	FMTENC12	B2
03	SFCSHP12	C2	16	GES12	B1
04	SFCBOG12	C2	17	FMANL12	B1
05	ADPUPA12	C2	18	ANL112	B1
06	AIRCFT12	C2	19	FM0012	B1
07	UPABOG12	C2	20	FM1212	B1
08	SATWND12	C2	21	FM2412	B1
09	AIRCAR12	C2	22	FM3612	B1
10	LFMBND12	B2	23	FM4812	B1
11	FMSIGN12	B2	24	SGANL12	B1
12	ERRANL12	B2	25	RADAR12	B1
13	SIGANL12	B2	26	DATE12	C2

GBL RUN HISTORY TAPE FOR THE 00Z CYCLE.

LOGICAL FILE	FILE NAME	DATA TYPE	LOGICAL FILE	FILE NAME	DATA TYPE
01	RUNHST	C2	21	F0000	B1
02	ADPSFC00	C2	22	F1200	B1
03	SFCSHP00	C2	23	F2400	B1
04	SFCBOG00	C2	24	F3600	B1
05	ADPUPA00	C2	25	F4800	B1
06	AIRCFT00	C2	26	F6000	B1
07	UPABOG00	C2	27	F7200	B1
08	SATWND00	C2	28	F8400	B1
09	AIRCAR00	C2	29	FXN00	B1
10	HUFGES00	B2	30	S0000	B1
11	HUFANL00	B2	31	S1200	B1
12	SMSANL00	B2	32	S2400	B1
13	SMS00000	B2	33	S3600	B1
14	SMS04800	B2	34	S4800	B1
15	SMS14400	B2	35	S6000	B1
16	TSFLAG00	C2	36	S7200	B1
17	TSDCTY00	C2	37	S8400	B1
18	SMTEND00	B2	38	SXN00	B1
19	GES00	B1	39	DATE00	C2
20	ANL00	B1			

GBL RUN HISTORY TAPE FOR THE 12Z CYCLE.

LOGICAL FILE	FILE NAME	DATA TYPE	LOGICAL FILE	FILE NAME	DATA TYPE
01	RUNHST	C2	21	F0012	B1
02	ADPSFC12	C2	22	F1212	B1
03	SFCSHP12	C2	23	F2412	B1
04	SFCBOG12	C2	24	F3612	B1
05	ADPUPA12	C2	25	F4812	B1
06	AIRCFT12	C2	26	F6120	B1
07	UPABOG12	C2	27	F7212	B1
08	SATWND12	C2	28	F8412	B1
09	AIRCAR12	C2	29	FXN12	B1
10	HUFGES12	B2	30	S0012	B1
11	HUFANL12	B2	31	S1212	B1
12	SMSANL12	B2	32	S2412	B1
13	SMS12120	B2	33	S3612	B1
14	SMS04812	B2	34	S4812	B1
15	SMS14412	B2	35	S6120	B1
16	TSFLAG12	C2	36	S7212	B1
17	TSDCTY12	C2	37	S8412	B1
18	SMTEND12	B2	38	SXN12	B1
19	GES12	B1	39	DATE12	C2
20	ANL12	B1			

FNL RUN HISTORY TAPE FOR THE 00Z CYCLE.

LOGICAL FILE	FILE NAME	DATA TYPE	LOGICAL FILE	FILE NAME	DATA TYPE
01	RUNHST	C2	24	SMFERR00	B2
02	ADPSFC00	C2	25	SIGGES06	B2
03	SFCSHP00	C2	26	SIGANL06	B2
04	SFCBOG00	C2	27	SIGINI06	B2
05	ADPUPA00	C2	28	SMFERR06	B2
06	UPABOG00	C2	29	TSFLAG00	C2
07	AIRCFT00	C2	30	TSFLAG06	C2
08	SATWND00	C2	31	TSDCTY00	C2
09	AIRCAR00	C2	32	TSDCTY06	C2
10	ADPSFC06	C2	33	GES00	B1
11	SFCSHP06	C2	34	GANL00	B1
12	SFCBOG06	C2	35	ANL500	B1
13	ADPUPA06	C2	36	GANL06	B1
14	UPABOG06	C2	37	GF1200	B1
15	AIRCFT06	C2	38	SGANL00	B1
16	SATWND06	C2	39	SGANL06	B1
17	AIRCAR06	C2	40	SGF1200	B1
18	HUFANL00	B2	41	SGF1218	B1
19	GESERR00	B2	42	SGINI00	B1
20	SIGGES00	B2	43	SGINI06	B1
21	SIGANL00	B2	44	DATE00	C2
22	SIGINI00	B2	45	DATE06	C2
23	ERRANL00	B2			

FNL RUN HISTORY TAPE FOR THE 12Z CYCLE.

LOGICAL FILE	FILE NAME	DATA TYPE	LOGICAL FILE	FILE NAME	DATA TYPE
01	RUNHST	C2	24	SMFERR12	B2
02	ADPSFC12	C2	25	SIGGES18	B2
03	SFCSHP12	C2	26	SIGANL18	B2
04	SFCBOG12	C2	27	SIGINI18	B2
05	ADPUPA12	C2	28	SMFERR18	B2
06	UPABOG12	C2	29	TSFLAG12	C2
07	AIRCFT12	C2	30	TSFLAG18	C2
08	SATWND12	C2	31	TSDCTY12	C2
09	AIRCAR12	C2	32	TSDCTY18	C2
10	ADPSFC18	C2	33	GES12	B1
11	SFCSHP18	C2	34	GANL12	B1
12	SFCBOG18	C2	35	ANL512	B1
13	ADPUPA18	C2	36	GANL18	B1
14	UPABOG18	C2	37	GF1212	B1
15	AIRCFT18	C2	38	SGNEW12	B1
16	SATWND18	C2	39	SGNEW18	B1
17	AIRCAR18	C2	40	SGF1212	B1
18	HUFANL12	B2	41	SGF1206	B1
19	GESERR12	B2	42	SGINI12	B1
20	SIGGES12	B2	43	SGINI18	B1
21	SIGANL12	B2	44	DATE12	C2
22	SIGINI12	B2	45	DATE18	C2
23	ERRANL12	B2			